

Clostridioides difficile

HOSPITALIZATIONS AMONG MICHIGAN RESIDENTS 2017-2021

WHAT IS CLOSTRIDIROIDES DIFFICILE?



Clostridioides difficile (*C. difficile*) is a bacterium that causes a range of disease, from asymptomatic colonization to severe diarrhea, colitis, toxic megacolon, bowel perforation, and death.^{1, 2, 3} Anyone can be affected, but certain factors can increase risk: antibiotic use, older age (65+), recent stay at a hospital or nursing home, weakened immune system, and a prior infection with *C. difficile* or known exposure to the organism.

Within the United States, *C. difficile* infection (CDI) is one of the most common healthcare-associated infections (HAI).⁵ 66% of all healthcare-associated CDI cases and 33% of all CDI cases occur in the 65 years and older age group.⁶ Moreover, there are an estimated 100,000 infections yearly among the nursing home population.⁶ 1 in 11 people over age 65 who are diagnosed with healthcare-associated CDI die within one month.²

DATA SOURCES



CDI hospitalization and death data were taken from the Michigan Inpatient Database (MIDB) and the Michigan Resident Death Files, managed by the State of Michigan Division for Vital Records and Health Statistics at the Michigan Department of Health and Human Services (MDHHS). We calculated yearly and 5-year aggregate counts, percentages, and rates per 100,000 persons for primary and related causes of hospitalization and death due to CDI. Data were stratified by sex, race, age, and county.

To calculate rates for each respective population and year, we used data from the American Community Survey (ACS) provided by the US Census Bureau. A one-year estimate was not available for 2020, therefore we used the 5-year estimate (2016-2020) to calculate rates for 2020. We calculated county rates by using the 5-year estimates (2017-2021). Wayne County and Detroit rates were calculated separately. We used R studio for data cleaning, formatting, wrangling, validation, and statistical analysis.

1 Hospitalization Rates of *C. difficile* Infection in Michigan, 2017-2021

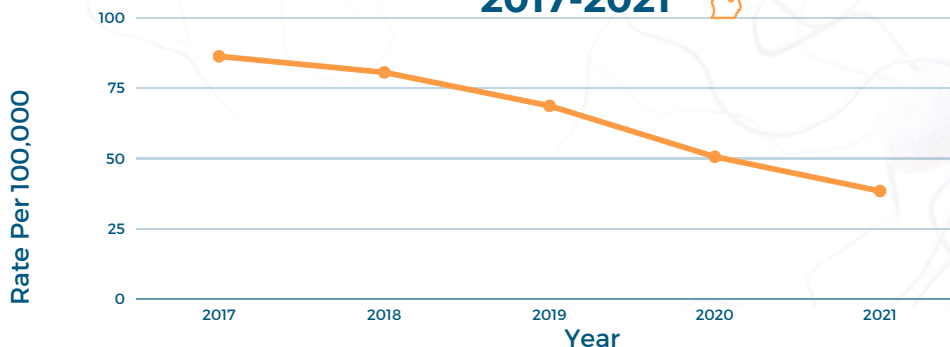


FIGURE 1

These data represent 32,426 hospitalizations in which *C. difficile* was recorded within the first five diagnoses on discharge. The rate per 100,000 persons decreased each year between 2017 and 2021, with a 55.5% decrease over the 5-year period.



Causes diarrhea and colitis

0.5M

Almost half a million
infections in the U.S.
each year



Contagious

2

Hospitalization Rates of *C. difficile* Infection in Michigan by Sex, 2017-2021

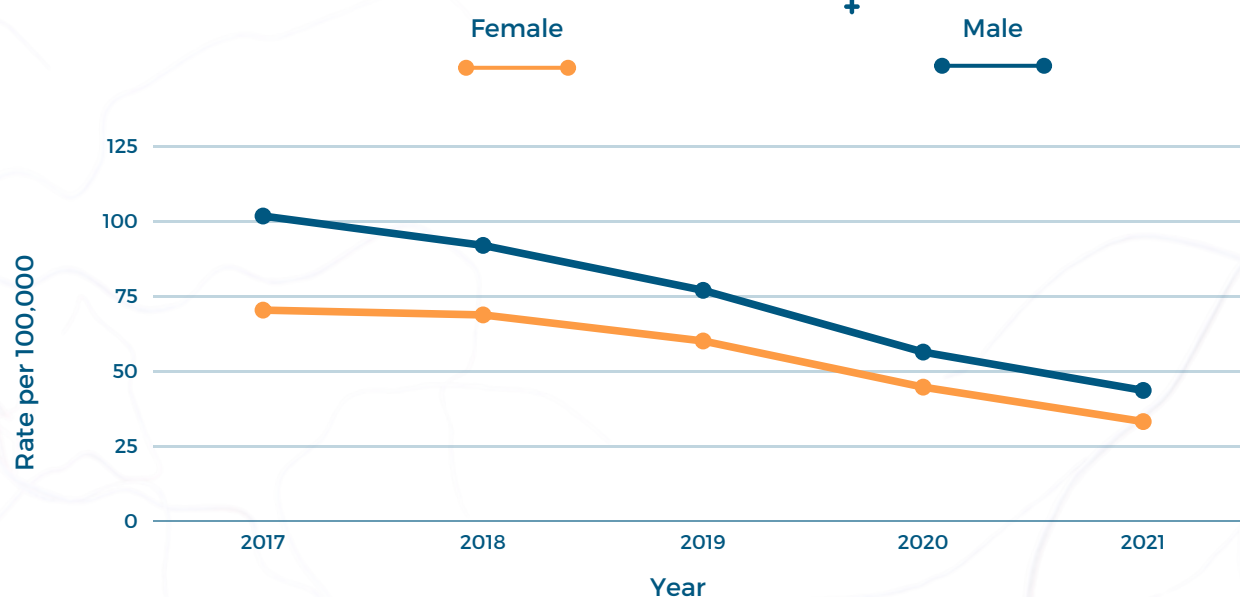


FIGURE 2

Rates for females were higher than for males consistently throughout the years observed.

3

Hospitalization Rates of *C. difficile* Infection in Michigan by Age Group, 2017-2021

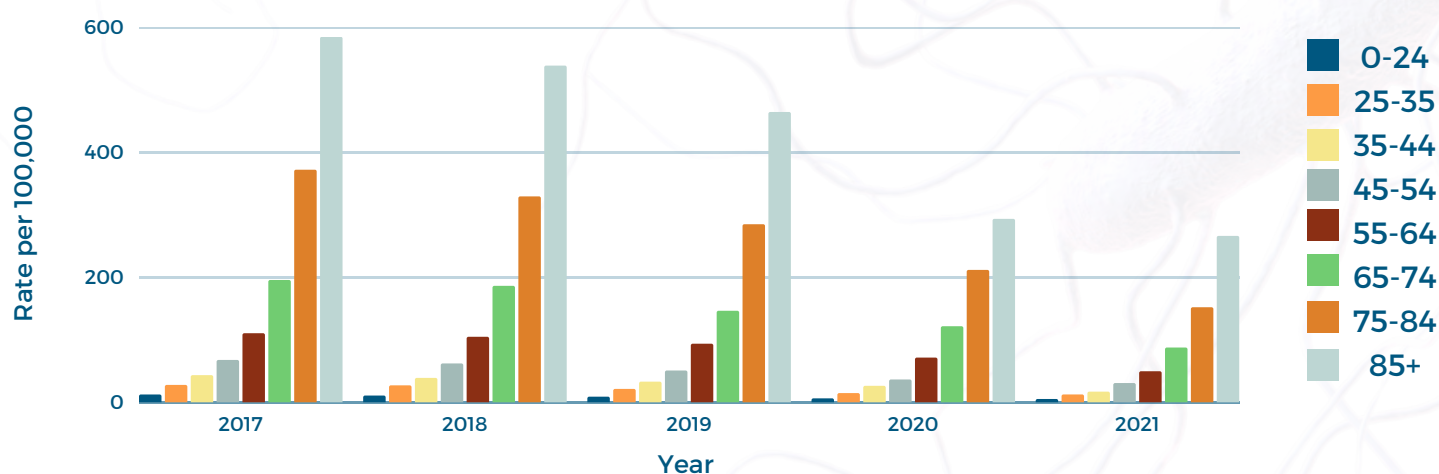


FIGURE 3

The yearly hospitalization rates per 100,000 were highest among persons aged 85+, followed by the 75-84 age group.

4

Hospitalization Rates of *C. difficile* Infection in Michigan by Race, 2017-2021

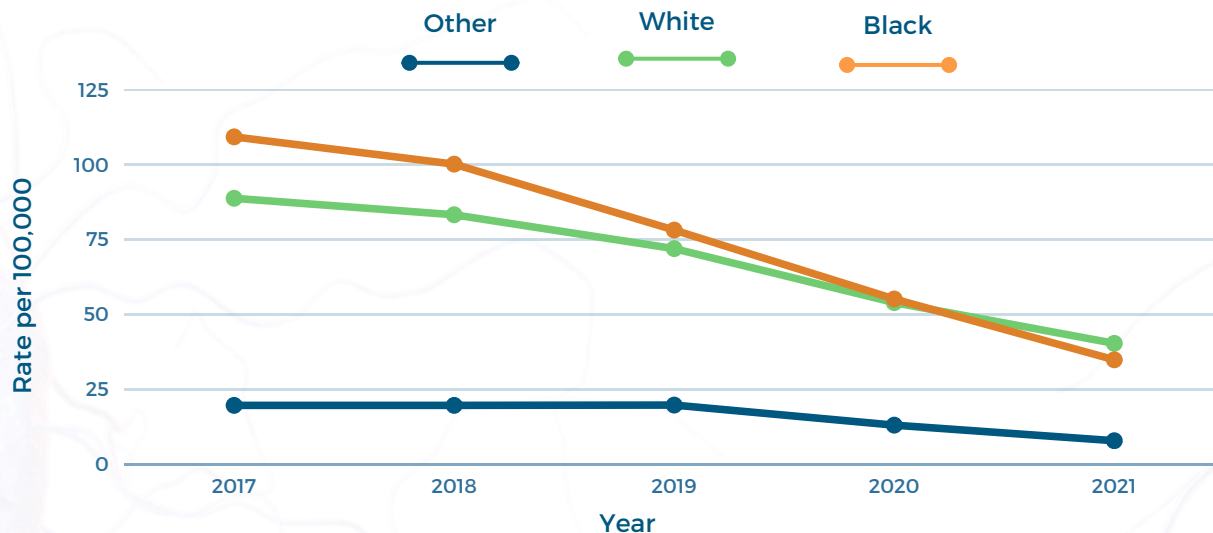


FIGURE 4

Of the 32,125 hospitalizations in which *C. difficile* was recorded as one of the first five diagnoses at discharge and race was documented, the rate per 100,000 persons decreased yearly for each race, except for a slight increase between 2018 and 2019 among other races. In 2021, the hospitalization rate for Whites was higher than for Blacks.

5 *C. difficile* Hospitalization Rates in Michigan by County per 100,000 – 2017-2021

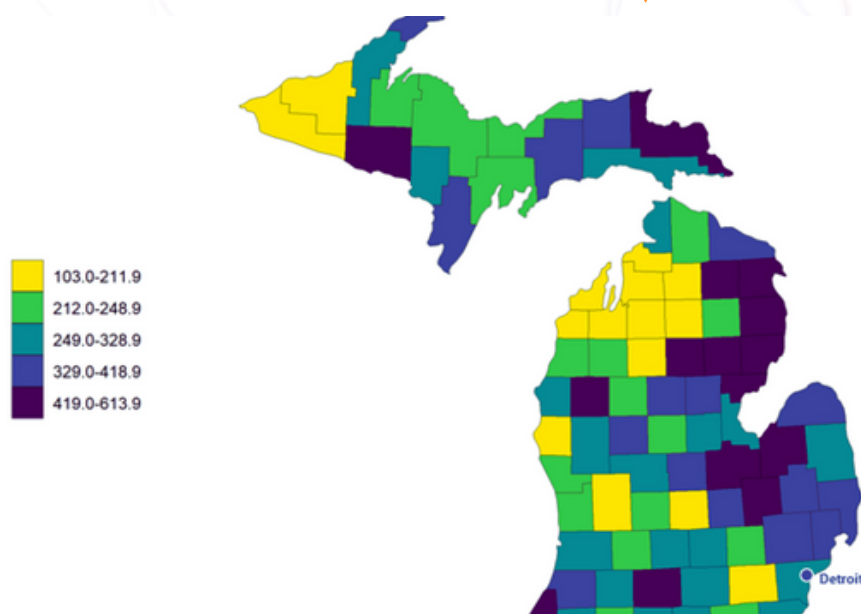


FIGURE 5

Hospitalization rates (per 100,000 persons) in which *C. difficile* appeared in the first five diagnoses upon discharge over the 5-year period of 2017-2021, by county of patient residence. Rates were calculated for Wayne County excluding Detroit and the city of Detroit

KEY FINDINGS

Hospitalizations in which *C. difficile* was a diagnosis are higher in the following groups:

- Female
- Black
- Older adults (75+)

LIMITATIONS

1. Rates are crude rates (total number of deaths, divided by the total population of interest, and multiplied by 100,000) and do not adjust for age.
2. There were missing/unknown values for some demographic variables.
3. It is unknown if decreased *C. difficile* hospitalization rates (2020-2021) could be attributed to fewer infections, lack of access to care, COVID-19 mitigation strategies, or a combination of all three.
4. Approximately 2% of acute care hospitals did not report to MIDB; records in which *C. difficile* appeared in the admitting diagnosis only were excluded.

References

1. Centers for Disease Control and Prevention. (2021, July 12). *C. diff* (*Clostridioides difficile*). Centers for Disease Control and Prevention. Retrieved April 5, 2023, from <https://www.cdc.gov/cdiff/index.html>
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6. Centers for Disease Control and Prevention. (2015, February 25). Nearly half a million Americans suffered from *clostridium difficile* infections in a single year. Centers for Disease Control and Prevention. Retrieved April 5, 2023, from <https://www.cdc.gov/media/releases/2015/p0225-clostridium-difficile.html#print>

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